

Alcatel 1905 LMI

Up to 20 mW WDM L-band version for external modulation

CW 1.55 μm Laser Module with optical Isolator

Description

This laser module contains an Alcatel SLMQW DFB laser and is designed for use with external modulation optimized for high power Wavelength Division Multiplexed (WDM) systems. The module incorporates a polarization maintaining fiber pigtail, thermoelectric cooler, precision thermistor, and optical isolator for stable operation under all conditions.

Features

- Up to 20 mW output power
- Wavelength selection according to ITU-T G.692 (L-band)
- 50 GHz spacing available

- Optimized for use with LiNbO₃ external modulator
- Polarization maintaining fiber pigtail
- InGaAsP Distributed FeedBack SLMQW (DFB) laser
- Integral optical isolator
- Internal TEC and monitor photodiode
- Industry-standard hermetic 14-pin butterfly package

Applications

- Ultra long haul DWDM synchronous digital transmission systems
- WDM submarine terminal digital transmission systems
- Instrumentation.



Optical characteristics

| Parameter | Symb. | Conditions | Min | Typical | Max | Units |
|---|----------------------------|--|----------|-------------|------------|------------|
| Threshold current | I_{th} | | | | 40 | mA |
| Output power | P_F | Twave = 15 to 30 °C Twave = 15 to 25 °C | 10 20 | | | mW mW |
| Forward voltage | V_F | Pf, pin 3 & 11 | | | 2.5 | V |
| Laser forward current | I_F | 10 mW, pin 3 & 11 20 mW, pin 3 & 11 | | | 120 210 | mA mA |
| Emission wavelength | λ_m | | | See table 1 | | |
| Δ (Emitted-Target) Wavelength | $\Delta\lambda_e$ | @Tchip[2] | - 0.1 | | + 0.1 | nm |
| Laser chip temperature range for tunability | T_λ | @10mW [2] @20mW [2] | 15 15 | | 30 25 | °C °C |
| Spectral width | $\Delta\lambda$ | CW, Pf, FWHM | | | 5 | MHz |
| Side mode suppression ratio | SMSR | Pf | 35 | | | dB |
| Relative Intensity Noise | RIN | 10MHz to 10 GHz @ Pf | | | -140 | dB/Hz |
| Photodiode dark current | I_d | V = -5 V | | | 100 | nA |
| Wavelength drift vs Tcase | $\Delta\lambda/\Delta T_c$ | | | | 0.5 | pm/°C |
| Thermistor resistance | R_{TH} | | 9.7 | | 10.3 | k Ω |
| Thermistor temperature coefficient | R_t | | - 3 | | - 5 | %/K |
| TEC current | I_t | [1] | | | 1.3 | A |
| TEC voltage | V_t | [1] | | | 2.5 | V |
| TE/TM fiber extinction ratio of pigtail | E_r | | 20 | | | dB |

Note : All limits start of life (except I_t , V_t), Tsubmount = 25 °C, Tcase = 25 °C, Pf = 20 mW, monitor bias – 5 V, unless otherwise stated

[1] Tcase = 70° C, Tsubmount = 20 °C, P = 20 mW

[2] Tchip = T_λ . T_λ is chip temperature required to meet target wavelength (see table 1)

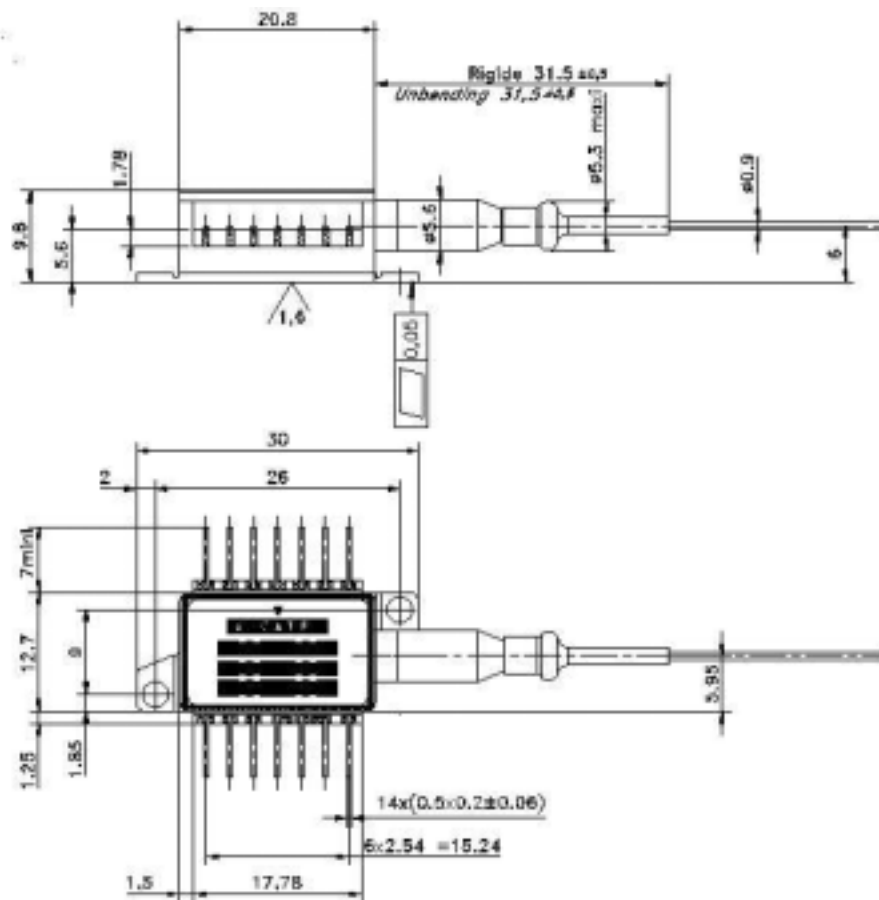
Absolute maximum ratings

| Parameters | Min | Max | Unit |
|--------------------------------|-----|-----|------|
| Operating case temperature | -10 | 70 | °C |
| Storage temperature | -40 | 85 | °C |
| Laser forward current | | 350 | mA |
| Laser reverse voltage | | 2 | V |
| Photodiode forward current | | 1 | mA |
| Photodiode reverse voltage | | 20 | V |
| TEC Voltage | | 2.8 | V |
| TEC Current | | 1.4 | A |
| Lead soldering time (at 260°C) | | 10 | s |
| Packing Mounting Screw Torque | | 0.2 | Nm |

[1] Human body model.

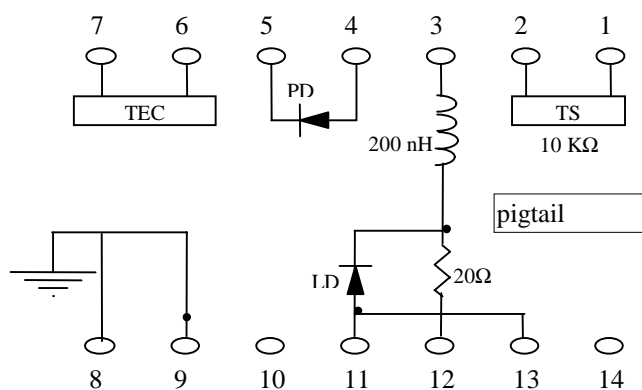
Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only.

Mechanical details



Pin out

| N° | Description | N° | Description |
|----|---------------------------|----|---------------|
| 1 | Thermistor | 8 | Case Ground |
| 2 | Thermistor | 9 | Case Ground |
| 3 | Laser DC bias (-) | 10 | Not Connected |
| 4 | Photodetector Anode (-) | 11 | RF common (+) |
| 5 | Photodetector Cathode (+) | 12 | RF input (-) |
| 6 | TEC (+) | 13 | Not Connected |
| 7 | TEC (-) | | |



Ordering information

Alcatel 1905 LMI

| Nominal power | Connector type | Part number [1] |
|---------------|-----------------|-----------------|
| 10 mW | FC/PC or FC/APC | 3CN 00386 ## |
| 10 mW | SC/PC | 3CN 00461## |
| 20 mW | FC/PC or FC/APC | 3CN 00410 ## |
| 20 mW | SC/PC | 3CN 00462 ## |

defines the wavelength and the connector according to table 1.

| λ | THz | Connector | |
|-----------|--------|----------------|--------|
| | | FC/PC SC/PC | FC/APC |
| 1570,00 | 190,95 | FV | RV |
| 1570,41 | 190,90 | FW | RW |
| 1570,82 | 190,85 | FX | RX |
| 1571,24 | 190,80 | FY | RY |
| 1571,65 | 190,75 | FZ | RZ |
| 1572,06 | 190,70 | GA | SA |
| 1572,47 | 190,65 | GB | SB |
| 1572,88 | 190,60 | GC | SC |
| 1573,30 | 190,55 | GD | SD |
| 1573,71 | 190,50 | GE | SE |
| 1574,12 | 190,45 | GF | SF |
| 1574,54 | 190,40 | GG | SG |
| 1574,95 | 190,35 | GH | SH |
| 1575,36 | 190,30 | GJ | SJ |
| 1575,78 | 190,25 | GK | SK |
| 1576,19 | 190,20 | GL | SL |
| 1576,61 | 190,15 | GM | SM |
| 1577,02 | 190,10 | GN | SN |
| 1577,44 | 190,05 | GP | SP |
| 1577,85 | 190,00 | GR | SR |
| 1578,27 | 189,95 | GS | SS |
| 1578,68 | 189,90 | GT | ST |
| 1579,10 | 189,85 | GU | SU |
| 1579,51 | 189,80 | GV | SV |
| 1579,93 | 189,75 | GW | SW |
| 1580,35 | 189,70 | GX | SX |
| 1580,76 | 189,65 | GY | SY |
| 1581,18 | 189,60 | GZ | SZ |
| 1581,60 | 189,55 | HA | TA |
| 1582,01 | 189,50 | HB | TB |
| 1582,43 | 189,45 | HC | TC |
| 1582,85 | 189,40 | HD | TD |
| 1583,27 | 189,35 | HE | TE |

| λ | THz | Connector | |
|-----------|--------|----------------|--------|
| | | FC/PC SC/PC | FC/APC |
| 1583,69 | 189,30 | HF | TF |
| 1584,10 | 189,25 | HG | TG |
| 1584,52 | 189,20 | HH | TH |
| 1584,94 | 189,15 | HJ | TJ |
| 1585,36 | 189,10 | HK | TK |
| 1585,78 | 189,05 | HL | TL |
| 1586,20 | 189,00 | HM | TM |
| 1586,62 | 188,95 | HN | TN |
| 1587,04 | 188,90 | HP | TP |
| 1587,46 | 188,85 | HR | TR |
| 1587,88 | 188,80 | HS | TS |
| 1588,30 | 188,75 | HT | TT |
| 1588,72 | 188,70 | HU | TU |
| 1589,14 | 188,65 | HV | TV |
| 1589,56 | 188,60 | HW | TW |
| 1589,98 | 188,55 | HX | TX |
| 1590,41 | 188,50 | HY | TY |
| 1590,83 | 188,45 | HZ | TZ |
| 1591,25 | 188,40 | JA | UA |
| 1591,67 | 188,35 | JB | UB |
| 1592,10 | 188,30 | JC | UC |
| 1592,52 | 188,25 | JD | UD |
| 1592,94 | 188,20 | JE | UE |
| 1593,37 | 188,15 | JF | UF |
| 1593,79 | 188,10 | JG | UG |
| 1594,21 | 188,05 | JH | UH |
| 1594,64 | 188,00 | JJ | UJ |
| 1595,06 | 187,95 | JK | UK |
| 1595,49 | 187,90 | JL | UL |
| 1595,91 | 187,85 | JM | UM |
| 1596,33 | 187,80 | JN | UN |
| 1596,76 | 187,75 | JP | UP |
| 1597,19 | 187,70 | JR | UR |



| λ | THz | Connector | |
|-----------|--------|----------------|--------|
| | | FC/PC SC/PC | FC/APC |
| 1597,61 | 187,65 | JS | US |
| 1598,04 | 187,60 | JT | UT |
| 1598,46 | 187,55 | JU | UU |
| 1598,89 | 187,50 | JV | UV |
| 1599,32 | 187,45 | JW | UW |
| 1599,74 | 187,40 | JX | UX |
| 1600,17 | 187,35 | JY | UY |
| 1600,60 | 187,30 | JZ | UZ |
| 1601,02 | 187,25 | KA | VA |
| 1601,45 | 187,20 | KB | VB |
| 1601,88 | 187,15 | KC | VC |
| 1602,31 | 187,10 | KD | VD |
| 1602,74 | 187,05 | KE | VE |
| 1603,16 | 187,00 | KF | VF |
| 1603,59 | 186,95 | KG | VG |
| 1604,02 | 186,90 | KH | VH |
| 1604,45 | 186,85 | KJ | VJ |
| 1604,88 | 186,80 | KK | VK |
| 1605,31 | 186,75 | KL | VL |
| 1605,74 | 186,70 | KM | VM |
| 1606,17 | 186,65 | KN | VN |
| 1606,60 | 186,60 | KP | VP |
| 1607,03 | 186,55 | KR | VR |
| 1607,46 | 186,50 | KS | VS |
| 1607,89 | 186,45 | KT | VT |
| 1608,32 | 186,40 | KU | VU |
| 1608,76 | 186,35 | KV | VV |
| 1609,19 | 186,30 | KW | VW |
| 1609,62 | 186,25 | KX | VX |
| 1610,05 | 186,20 | KY | VY |

Table 1, All wavelengths referenced to vacuum @ Tsubmount

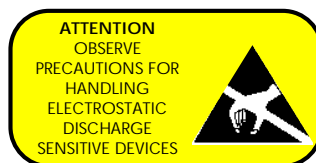
Standards

ITU-T G.652 optical fiber

IEC 68-2 and MIL STD 883 environment



LASER RADIATION
AVOID EXPOSURE TO BEAM
Class 3 B laser product



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